Escherichia coli 0157:H7 & Other Shiga Toxin-Producing *E. coli* (STEC) Investigation Guidelines

Contents

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Escherichia coli 0157:H7 & Other Shiga Toxin-Producing *E. coli* (STEC) Disease Management and Investigation Guidelines

CASE DEFINITION (CDC 2005)

A. Clinical Description for Public Health Surveillance:

An infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps. Illness may be complicated by hemolytic uremic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP); asymptomatic infections also may occur and the organism may cause extraintestinal infections.

B. Laboratory Criteria for Case Classification:

- Isolation of *Escherichia coli* O1 57:H7 from a clinical specimen, or
- Isolation of Shiga toxin-producing *E. coli* (STEC) from a clinical specimen

Note: *E. coli* 0157:H7 is assumed to be Shiga toxin-producing; for other *E. coli*, Shiga toxin production or toxin genes must be detected to consider STEC.

C. Case Classification:

- Confirmed: A case that meets the laboratory criteria for diagnosis. When available, O and H antigen serotype characterization should be reported.
- Probable:
  - A case with isolation of *E. coli* O157 from a clinical specimen, pending confirmation of H7 or Shiga toxin production, or
  - A clinically compatible case that is epidemiologically linked to a confirmed or probable case, or
  - Identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype from a clinically compatible case.
- Suspect:
  - A case of post-diarrheal HUS or TTP.
  - Identification of Shiga toxin in a specimen from a clinically compatible case without isolation of Shiga-toxin producing *E. coli.*

D. Laboratory Testing:

- Collection: Use an enteric kit (bottle with a Cary-Blair medium (0.16% agar))
- Specimen: Feces
- Amount: Marble size (preferred) or two rectal swabs per container.
- Timing: Collect >48 hours after the discontinuation of antibiotics.
  - For removal of work or school restrictions collect 2 specimens at least 24 hours apart.
- Special media is required for *E. coli* 0157 isolation; specific testing needed to detect toxin production. May not have been done commercially.
- Submission of STEC isolates to the Kansas Health and Environmental Laboratories (KHEL) is required by law. Pulsed-field gel electrophoresis (PFGE) is performed on all STEC isolates at KHEL.
- For additional information and/or questions concerning isolate submission, specimen collection/transport and laboratory kits call (785) 296-1620 or refer to online guidance at http://www.kdheks.gov/labs/lab_ref_guide.htm.

E. Bioterrorism Potential:

As a category B agent and food safety threat, it is moderately easy to disseminate, results in moderate morbidity but low mortality, and requires specific enhancements of CDC's diagnostic capacity and disease surveillance.

F. Outbreak Definition:

- An unexpected, unexplained increase in cases clustered by time, place, or person; or
- Two or more cases in different households with the same strain or pulsed-field gel electrophoresis (PFGE) pattern clustered by person, place, or time (within the incubation period for the agent).

INVESTIGATOR RESPONSIBILITIES

A. Investigation Relate Tasks and Activities:

1) Confirm diagnosis with appropriate medical provider
- Before contacting the patient, discuss with the health care provider what the patient has been told about his/her evaluation for disease.
- Obtain information that supports clinical findings in case definition and information on the date of service or onset date of the symptoms.
- Obtain information on laboratory tests performed and results.
  - If *E. coli* was not isolated from the clinical specimen (i.e. only testing for Shiga-toxin was done), contact laboratory to have the stool specimen forwarded to state lab for isolation procedures.
  - If STEC or presumptive STEC (including *E. coli* 0157) was isolated from clinical specimen, ensure bacterial isolate was sent to state lab.
- If patient hospitalized, obtain medical records, including admission notes, progress notes, lab report(s), and discharge summary.

2) Conduct case investigation to identify potential source of infection.

3) Conduct contact investigation to locate additional cases and/or contacts.
- Determine if case is involved in a high-risk occupation or if another special situation is involved (e.g. food handler, daycare provider or attendee, direct patient care provider).

4) Identify whether the source of infection may be of major public health concern, such as a commercial raw milk dairy or public water supply.

5) Initiate control and prevention measures to prevent spread of disease.
- Provide education that includes basic information about the disease and ways to prevent transmission of illness.
- If needed, work with appropriate regulatory personnel to ensure that work restrictions or exclusions are initiated for high-risk cases and/or contacts (e.g. food handler, daycare, direct patient care provider).

6) Report all cases to the KDHE Office of Surveillance and Epidemiology at KDHE using established methods.

B. Notifications:

- No special notifications or additional reporting unless the case is associated with an outbreak. Then the investigator should <u>immediately</u> notify the Local Health Officer, the local on-call epidemiologist and KDHE (1-877-427-7317).

- As appropriate, use the notification letter and the disease fact sheet to notify the case, contacts and other individuals or groups.

EPIDEMIOLOGY

More than 100 serotypes of *E. coli* produce Shiga or Shiga-like toxins. The most commonly identified Shiga toxin-producing *E. coli* (STEC) in North America is *E. coli* O157:H7 (i.e., "*E. coli* O157" or "O157") which was first identified in 1982. In the U.S., it is estimated that 70,000 infections per year are caused by *E. coli* O157. Persons of all ages are susceptible. Very young children and the elderly are more likely to develop severe illness and hemolytic uremic syndrome (HUS). Sporadic cases occur throughout the year and peak in the summer. Ground beef, apple cider, unpasteurized milk and other foods have been associated with outbreaks.

DISEASE OVERVIEW

A. Agent:
Gram-negative bacilli*, Escherichia coli,* that produce Shiga and Shiga-like toxins. In addition to *E. coli* O157, the most common serogroups in the United States are O26, O111, O103, O45, and O121.

B. Clinical Description:
Majority of cases present with an acute onset of diarrhea 3 to 4 days after exposure. Other symptoms include abdominal cramping and grossly bloody diarrhea. Fever may or may not be present. Severe cases can develop HUS that results in renal failure and death.

C. Reservoirs:
Cattle are of significant public health importance; however, humans and other animals, such as goats, sheep, and deer, serve as reservoirs and carriers.

D. Mode(s) of Transmission:
Fecal-oral, including: person-to-person, animal-to-person, waterborne and foodborne. Transmission occurs from consuming food or liquids, including water, contaminated with human or animal feces. Transmission may occur via types of sexual contact (e.g., oral-anal contact).

E. Incubation Period:
Ranges 1-10 days; average 3-4 days.

F. Period of Communicability:
Variable, for as long as the organism is excreted; typically 1 week in adults and up to 3 weeks in some children.

G. Susceptibility and Resistance:
The infectious dose is very low and little is known about differences in susceptibility between serotypes.

H. Treatment
Fluid and electrolyte replacement therapy may be indicated. There is evidence that antibiotic treatment may precipitate HUS and its use is controversial. Anti-diarrheal medication should be avoided.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Standard investigation activities include the following:

1) Confirmation of diagnosis using case definition.
2) Collection of demographic data (birth date, county, sex, race/ethnicity)
3) Collection of clinical data (symptoms and laboratory results supporting case definition, onset date and time, and if available recovery date and time).
4) Determination of risk factors (e.g., association with daycare, hospital, restaurant or animals, travel history).
5) Investigation of epi-links among cases (cluster, household, co-workers, etc).

Standard investigation **includes** completion of the General Investigation Form and Enteric Supplemental Form. Further investigative activity should include:

A. Case Investigation - Identify Potential Source of Infection:

Focus within the incubation period and on potential sources of infection:

- Exposure to others with diarrhea in or outside of household. Obtain relationship to case, occupation(s) and dates.
- Food history, 7 days prior to onset, including place of purchase (e.g., poorly cooked beef products, unpasteurized dairy products or juice, melons, lettuce and sprouts). Consider opportunities for cross-contamination.
- Restaurant or group gathering history, 7 days prior to onset. Obtain name, location of restaurant / gathering, food eaten and exposure dates.
- Contact with animals 7 days prior to onset. Specify type and location (e.g. farm, petting zoo, school).
- In-state and out-of-state travel up to 2 weeks prior to onset. Obtain dates and locations. (Including hiking, camping or hunting trips.)
- Drinking water sources. Specify type (e.g. private, treated, or bottled)
- Recreational water exposure. Obtain dates, locations and participation type.
- Associated with childcare, residential facility or institution. Obtain dates and locations.
- Health history; underlying medical conditions, medical/surgical or GI procedures, medicines (including over-the-counter and “organic/holistic” or vitamins and herbs.)
- Occupation; those at high-risk for transmitting illness include food handlers, childcare provider and persons involved in direct patient care.
- For infants $\leq$ 3 months of age, if a source is not identified, may need to obtain detailed epidemiologic data and cultures on caretaker(s), even if asymptomatic. Carefully review food-handling practices to determine whether cross-contamination of infant formula or food may be involved.

B. Contact Investigation – Identify Exposed Individuals / Populations:

Consider the following types of contacts during a STEC contact investigation:

- General contacts: Household, close contacts and sexual partners of a case.
- Daycare contacts:
  - All direct caregivers and room/classmates of the case in a daycare with only children who are toilet trained or who are all over 2 years of age.
  - All employees and attendees of a daycare with non-toilet trained

attendees, if one or more employee or child is infected or if household contacts of two or more separate attendees are infected.
  - All employees, attendees and household contacts of diapered attendees of a daycare in which outbreak recognition is delayed by ≥3 weeks.
  - Individuals who work the same shift in a daycare kitchen with an infectious food handler are also considered contacts.
  - Daycare attendees and employees who eat food prepared by an infected food handler, especially if the food handler handled ready-to-eat foods with bare hands or worked while experiencing diarrhea.
- School Contacts: With epidemiologic evidence of transmission in a school setting consider those who share similar exposure activities with the cases (e.g. common food/drink, animal or recreational water sources).
- Food Service Contacts:
  - Co-workers who work the same shift as the infected food handler.
  - Patrons of the establishment of an infected food handler if (1) the food handler worked while infectious, (2) had poor personal hygiene, and (3) had the opportunity to have bare-hand contact with ready-to-eat food.

C. Isolation, Work and Daycare Restrictions

- K.A.R 28-1-6 for Shiga toxin-producing *Escherichia coli* (STEC):
  - Enteric precautions followed for the duration of acute symptoms.
  - Each infected person shall be excluded from food handling, patient care, and any occupation involving the care of young children and the elderly, until two negative stool cultures are obtained at least 24 hours apart and no sooner than 48 hours following discontinuation of antibiotics.
  - No infected child shall attend a child care facility, or a family day care home until two negative stool cultures are obtained at least 24 hours apart and no sooner than 48 hours following discontinuation of antibiotics.
- The Kansas Food Code has additional requirements. Consult **Table 1** on page 12 if any of the following situations are identified with a food handler:
  - Experiencing diarrhea, fever, or vomiting
  - Diagnosed with illness due to STEC.
  - Asymptomatic but stools positive for *E. coli* 0157:H7
  - Past illness with STEC within the last month
  - Consumed or prepared food implicated in a foodborne outbreak or consumed food in a setting prepared by a person ill with STEC
  - Has a household contact that worked or attended a setting where there was a foodborne disease outbreak or has been diagnosed with STEC.
- School attendees are excluded from school until after diarrhea has stopped for 24 hours.
  - In school-based outbreaks of *E. coli* O157:H7, it is recommended an ill child not be allowed to reenter their room until diarrhea has stopped and two stool cultures are negative for *E. coli* O157:H7.
- Cases should not swim or engage in other form of recreational water use until 2 weeks after symptoms resolve.

D. Case Management, Including Follow-up of cases:

- Educate case on measures to avoid future illness and its transmission.
- Follow-up is indicated if a case cares for young children, the elderly or patients or handles food to assure compliance with work restrictions.
- Additional stool cultures are not routinely indicated, except for the purpose of lifting work or school or daycare restrictions.
- If necessary, reference the Kansas Community Containment Toolbox for templates concerning isolation measures.

E. Contact Management, Including Protection of Contacts:

- Protection or prophylaxis: None.
- Provide education on avoiding further exposures and to ensure proper medical care is obtained and precautions taken if symptoms develop.
- Symptomatic contact: Considered a probable case; initiate any work or daycare restrictions. Encourage to seek medical evaluation.
- Cultures to confirm epi-linked cases may be warranted in outbreak situations.
- A contact that is a food-handler should be restricted in facilities that serve highly susceptible populations. Consult **Table 1** on page 12.
- Follow-up of contacts may be needed to assure no transmission of disease.

F. Environmental Measures:

- None, unless a commercial food service facility, daycare, public water or commercial raw milk dairy is implicated. In which case the following activities should be coordinated through the proper regulatory agency:
  - Inspection of the facility.
  - Collection of food, drink or water samples
- Consult the KDHE Foodborne Illness and Outbreak Investigation Manual.
- Proper chlorination or boiling of water prevents illness transmission.
- Clean and sanitize potentially contaminated surfaces with 1% bleach or proper germicides.

G. Education:

- Advise cases and contacts on measures to avoid future exposures.
  - Emphasis on hand washing, cleaning fingernails and personal hygiene.
  - Wash hands thoroughly with soap and water before eating/handling food or after handling raw food, after using the toilet, after changing diapers and after handling pets, fowl, or other animals and/or feces.
  - Avoid eating raw or undercooked meat or poultry, especially hamburger. Cook hamburger to an internal temperature of at least 160°F (70°C).
  - Do not drink unpasteurized milk or juice or eat anything made from it.
  - Use only clean utensils, dishes and cutting boards to prepare food that is already cooked or will be eaten raw or lightly cooked. Anything used to prepare raw meat, seafood, or poultry, including hands and table or counter top, should be washed thoroughly before touching other food.
  - Wash fresh produce before cutting or consuming.

- Properly refrigerate and store perishable foods. Store in small containers and do not leave at room temperature for more then 2 hours.
- Avoid drinking or swallowing untreated surface water. Surface water should be boiled or otherwise disinfected before consumption.
- When taking care of someone who has diarrhea scrub hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes or soiled sheets.

- As needed, inform of communicability, incubation period and symptoms.
- Use the "Public Health Fact Sheet on *E. coli*" to assist with education.

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

- Notify KDHE immediately, 1-877-427-7317.
- Consult KDHE Foodborne Illness and Outbreak Investigation Manual for outbreaks involving food.
- Consult KDHE Control of Enteric Outbreaks in Child-Care Facilities for circumstances involving child-care.
- Organize and maintain all data related to outbreak:
  - Construct and maintain case listing which includes:
    - KS-EDSS ID,
    - Name, DOB (or age) and any other specific demographics,
    - Symptoms; onset date and time; recovery date and time
    - Source of exposure (i.e., case ID, setting, classroom),
    - Specimen collection date,
    - Lab results,
    - Case status (i.e., confirmed, probable, suspect)
  - Use tracking tools (logbooks, chalkboards or databases) to record actions needed for each suspected case (i.e., deliver stool kit, call)
- Identify population(s) at risk of infection based on the scope and spread of the outbreak; use the information collected in case investigations to define:
  - Person: who is becoming ill (i.e., age, gender, occupations).
  - Place: where are the cases (i.e. classrooms, address) and to what settings or activities are they associated.
  - Time: when did it start and is it still going on.
- Enhance surveillance and perform active case finding:
  - Maintain active surveillance with medical providers serving the affected communities for two incubation periods from last confirmed case.
- Outbreak control:
  - Target efforts on those population(s) identified as at risk.
  - Establish protocols for control measures necessary for all likely situations (i.e., exposure in child care center, school).
- Media attention can become intense during the course of the investigation. Coordinate with the local public information officer (PIO) and/or KDHE PIO.

B. Daycare Worker or Attendee:

For one case, proceed with the following activities:

- Interview the operator and request review of attendance records to identify other possible cases among staff or attendees in the past 2 weeks.
- Coordinate the collection stool specimens or rectal swabs from any other attendees or staff with a history of diarrheal illness within the past 2 weeks.
- Reinforce the need to exclude culture positive (symptomatic and asymptomatic) children and adults until after the submission of two negative stool samples taken from the excluded person 24 hours apart and, if treated, 48 hours after the discontinuation of any antibiotic treatment.
- Educate on how to prevent disease transmission at the center and at home.
- If >1 case or suspected case is identified among attendees or workers at a daycare facility, a thorough inspection of the facility is indicated.
  - Contact KDHE and refer to the "Outbreak Investigation" section above.
  - Coordinate additional activities with the local daycare inspector and the Kansas Child-Care Licensing Program.
  - Request stool samples from the following:
    - Symptomatic and asymptomatic children, food handlers and childcare givers.
    - Symptomatic household/close contacts of symptomatic individuals.
    - Asymptomatic household/close contacts who are engaged in sensitive occupations such as food handling or direct patient care.
  - Recommend treatment for asymptomatic and symptomatic laboratory confirmed children, food handlers and care givers.
    - **Note:** Experts would not recommend treating children with E. coli 0157 enteritis with antibiotics.
    - Culture confirmed household /close contacts should receive treatment for symptoms only; antibiotics are not generally recommended.
  - Exclude the following individuals until they have had no diarrhea for 24 hours and have submitted two negative stool samples taken 24 hours apart and, if treated, 48 hours after the end of any antibiotic treatment.
    - All symptomatic children and adults
    - All asymptomatic individuals who are STEC culture positive
  - Investigate hand washing, diapering and disinfection procedures.
  - Investigate for possible source of infection and routes of transmission:
    - Suspect index cases.
    - Animal contact (on-site and field trips).
    - Water-play areas.
    - For suspected point source outbreaks, collect menus of food and drinks served during the last 7 days from the first date of onset.
  - Review findings with daycare operator and implement control measures.
  - Consider closing daycare to new admissions if there is evidence of noncompliance. Closure to readmission or temporary closure is not recommended. Permanent closure/revocation of license may occur if deemed necessary by the Child Care Licensing Program.

- The facility operator should be instructed to call the health department immediately if new cases of diarrhea occur.
- Call or visit each week for 2 weeks after the last case's onset to verify no further cases and that appropriate hygienic measures are being carried out.

C. Case Is a Food handler or Restaurant Is Implicated:

For one case, proceed with the following activities:

- Coordinate the following activities with the local food facility inspector and the Kansas Department of Agriculture (KDA) as needed.
  - KDA Division of Food safety and Lodging regulates grocery stores, convenience stores, restaurants, schools, senior meal sites, mobile food units, lodging facilities, food wholesalers and warehouses, food processors and food manufacturers.
- Interview the manager and identify other possible cases among staff or patrons within the past 2 weeks.
  - The first page of the "Gastrointestinal Employee Survey" in the KDHE Foodborne Illness and Outbreak Manual can be used as a tool.
- Coordinate the collection of stool samples or rectal swabs from any staff member with history of diarrheal illness within the past 2 weeks.
- Refer to the above "Isolation, Work and Daycare Restrictions" for further instruction on exclusion and restriction of food handlers.
- If one case or suspect case is identified among staff or if >1 case or suspected case is associated with the facility, a thorough inspection of the establishment is indicated.
  - For a suspected outbreak, notify the KDHE and refer to the "Outbreak Investigation" section above.
  - Coordinate inspection, collection of any food samples and survey delivery with the food facility inspector and appropriate regulatory agency.
  - Use the complete "Gastrointestinal Employee Survey" to identify ill employees.
- The facility operator should be instructed to call the health department if new cases of diarrhea occur.

D. Public Gathering Implicated:

- Sources may include undercooked meat, cross-contaminated food, or possibly food contaminated by food handler.
- Conduct active case finding; ask about recent illness among food handlers.
- If a food establishment or distributer is implicated as the source of infection refer to "Case Is a Food Handler or Food Establishment Is Implicated."
- If animal sources in public places are implicated:
  - Hygienic and control measures may need to be initiated on farms, petting zoos or fairs. (Refer to Animals in Public Places Compendium.)
  - Proper hand washing after handling animals should always be stressed.

E. Commercial Dairy or Community Water Source Implicated:

- Consult with the State epidemiology staff if a case reports drinking raw milk

from a commercial dairy with no other identifiable source of infection or when the investigation implicates a community drinking water system.

F. Health Care Setting Associated:

- Hospitals: Diarrheogenic *E. coli,* while usually community acquired, is occasionally associated with nosocomial infections.
  - Nosocomial describes infections not present or incubating prior to the patient being admitted but acquired in hospitals and usually observed >48 hours after admission. As the incubation period will vary to some extent based on underlying health conditions, each infection should be assessed individually. Nosocomial infections include those acquired in the hospital but not evident until after discharge.
  - Coordinate investigation efforts with hospital infection control.
- Nursing home: Crowded communal living conditions and age-related risk factors including immune status and higher rates of antibiotic usage, dementia, and incontinence may allow transmission of enteric pathogens.
  - Coordinate investigation efforts through nursing home administrator.
  - Kansas Department of Aging should be notified if a nursing home, adult care, or long-term care facility is involved in an outbreak.

G. Intentional Contamination

- If suspected, notify local law enforcement and state public health officials.
  - Consider epidemiologic clues and law enforcement guidance.
  - Observations during environmental assessments may provide evidence.
- Implement "Chain of Custody" procedures for all samples collected, as they will be considered evidence in a criminal investigation.
- Refer to the KDHE Foodborne Illness and Outbreak Investigation Manual for further guidance.

DATA MANAGEMENT AND REPORTING TO THE KDHE

A. Organize, collect and report data utilizing the "General Investigation Form" and "Enteric Disease Supplemental Form".

B. Report data electronically via KS-EDSS or by fax, include:

- All essential data that was collected during the investigation, especially data that helps to confirm or classify a case.
  - For epi-linked cases, please include the KS-EDSS investigation ID of the related case in the notes section.
- All information collected on the supplemental form.

Note: If a patient meets the case definition for both Shiga toxin-producing E. coli (STEC) and Hemolytic Uremic Syndrome (HUS), the case should be reported for each of the conditions.

ADDITIONAL INFORMATION / REFERENCES

A. **Treatment / Differential Diagnosis:** American Academy of Pediatrics. 2006 Red Book: Report of the Committee on Infectious Disease, 27th Edition. Illinois, Academy of Pediatrics, 2006.

B. **Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 18th Edition. Washington, DC, American Public Health Association, 2004.

C. **Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: http://www.cdc.gov/ncphi/disss/nndss/casedef/case_definitions.htm

D. **Quarantine and Isolation:** Kansas Community Containment Isolation/ Quarantine Toolbox Section III, Guidelines and Sample Legal Orders http://www.waldcenter.org/Quarantine%20and%20Isolation%20Information%20for%20Health%20Officers.pdf

E. **Kansas Regulations/Statutes Related to Infectious Disease:** http://www.kdheks.gov/epi/regulations.htm

F. **KDHE Foodborne Illness and Outbreak Investigation Manual:** http://www.kdheks.gov/epi/download/kansas_foodborne_illness_manual.pdf

- Section 5, Environmental Health Assessment, including Intentional Contamination of Food investigation guidance.
- Appendix D, Exclusion and Restriction Requirements for Food handlers.

G. **KDHE Control of Enteric Disease Outbreaks in Childcare Facilities:** http://www.kdheks.gov/epi/download/Enteric_Disease_in_Day_care_centersver4.pdf

H. **Animals in Public Places Compendium:** http://www.kdheks.gov/epi/human_animal_health.htm

I. **KDHE Foodborne Illness Resources:** http://www.kdheks.gov/epi/foodborne.htm

J. **Additional Information (CDC):** http://www.cdc.gov/health/default.htm

Table 1. Managing a Food Handler That is Associated to STEC						
Diarrhea?	**Diagnosed with STEC?**	**Stool Culture Positive for *E. coli* 0157:H7?**	**Illness in last month with STEC**	**Exposed † to STEC**	**Restriction or Exclusion ‡**	**Reinstatement of Employee to Full Duties**
Yes	Yes				**Exclude** from all facilities. Reduce to **restriction** in facilities not serving highly susceptible populations* after asymptomatic for 24 hours.	With the approval from regulatory authority. §
Yes	No				**Exclude** from facilities that serve highly susceptible populations*. **Restrict** in other situations.	After asymptomatic for 24 hours or with written medical documentation that the symptom is noninfectious.
No		Yes			**Exclude** from facilities that serve highly susceptible populations*. **Restrict** in other situations.	With the approval from regulatory authority. §
No		No	Yes		**Exclude** from facilities that serve highly susceptible populations*.	With the approval from regulatory authority. §
No	No	No	No	Yes	**Restrict** from facilities that serve highly susceptible populations*.	3 days after employee was exposed or after household contact became asymptomatic.
(Refer to the **KDHE Foodborne Illness and Outbreak Investigation Manual** for additional information)						

† Exposure is defined as a food handler consuming or preparing food implicated in a foodborne outbreak of STEC or that was prepared by a person infected with STEC or a food handler who has a household contact that attended or worked at a setting where there was a foodborne outbreak of STEC or who was diagnosed with STEC.

‡ Exclusion is not allowing the employee to work at the food establishment. Restriction is not allowing the employee to work with food; to clean equipment, utensils or linens; or to un-wrap single-use articles in the food establishment.

* A highly susceptible population is more likely to experience foodborne disease because they are immunocompromised or older adults and in a facility that provides health care or assisted living services, such as a hospital or nursing home; or preschool age children in a facility that provides custodial care, such as a daycare center.

§ Approval by a regulatory authority (i.e. local health officer) requires written documentation of 2 consecutive negative stools taken 48 hours after discontinuance of antibiotics and 24 hours apart or a declaration that the person has been asymptomatic for 7 days.

Kansas Disease Investigation Guidelines

General Investigation Form

Investigation Information

Case Type: ☐Human Case ☐Non-human Case ***Disease Name:*** _____

Classification: ☐Suspect ☐Probable ☐Confirmed ***KS-EDSS Investigation ID:*** _____

Outbreak: ☐Yes ☐No ***Outbreak Name:*** _____ ***Outbreak #:*** _____

Onset Date: _____ ***Diagnosis Date:*** _____ ***Report Date:*** _____

Assigned to (Investigator): _____ ***Patient Died:*** ☐Yes ☐No ☐Unknown

Patient Information

Name Type: ☐Default/Common ☐Legal ☐Maiden ☐Nickname

Last: _____ ***First:*** _____ ***Middle:*** _____

Street: _____ ***City/State:*** _____ ***Zip:*** _____

Evening Phone #: _____ ***Daytime Phone #:*** _____

Sex: ☐Failure to Report ☐Female ☐Male ☐Other ☐Transexual ☐Unknown

Race: ☐American Indian or Alaska Native ☐Asian ☐Black or African American ☐Native Hawaiian or Other Pacific Islander ☐White ☐Unknown

Hispanic / Latino Ethnicity: ☐Yes ☐No

Date of Birth: _____ ***Age:*** _____ ***Age Unit:*** ☐Days ☐Weeks ☐Months ☐Years

Parent Information (if under 18)

Last: _____ ***First:*** _____ ***Middle:*** _____

Street: _____ ***City/State:*** _____ ***Zip:*** _____

Evening Phone #: _____ ***Daytime Phone #:*** _____

Work / Occupation or School / Grade

Worksites / School: _____

Occupations / Grade: _____

Travel History

1st ***Destination:*** _____ ***Depart Date:*** _____ ***Return Date:*** _____

2nd ***Destination:*** _____ ***Depart Date:*** _____ ***Return Date:*** _____

3rd ***Destination:*** _____ ***Depart Date:*** _____ ***Return Date:*** _____

4th ***Destination:*** _____ ***Depart Date:*** _____ ***Return Date:*** _____

Reporting Source

Title: _____ *Last Name:* _____ *First Name:* _____

Facility: _____ *County:* _____

Street: _____ *City/State:* _____ *Zip:* _____

Phone #: _____ *E-mail:* _____

Primary or Attending Physician

Title: _____ *Last Name:* _____ *First Name:* _____

Facility: _____ *County:* _____

Street: _____ *City/State:* _____ *Zip:* _____

Phone #: _____ *E-mail:* _____

Hospital Information

Hospitalized: ☐Yes ☐No *Patient Status Date:* _____

Hospital Name: _____ *Hospital City:* _____

Date Hospitalized: _____ *Number of Days Hospitalized:* _____

Notes

Supplemental Laboratory Report Form

Lab Reports

Laboratory Name: _____ ***Lab Report Date:*** _____

Ordering Provider Name: _____ ***Phone:*** _____ ***Facility:*** _____

Specimen Accession Number: _____ ***Specimen Collection Date:*** _____

Organism Name: _____ ***Organism Species:*** _____

Organism Serogroup: _____ ***Organism Serotype:*** _____

PFGE Results

Pattern 1 ***KS:*** _____ ***Other State:*** _____ ***CDC:*** _____

Pattern 2 ***KS:*** _____ ***Other State:*** _____ ***CDC:*** _____

Pattern 3 ***KS:*** _____ ***Other State:*** _____ ***CDC:*** _____

Additional Results Information

Reported Test Name:	*Coded Result:*	*Text Result:*	*Numeric Result:*	*Comments:*

Supplemental Contact Form

Contacts

Last: _____ ***First:*** _____ ***Middle:*** _____

Street: _____ ***City/State:*** _____ ***Zip:*** _____

Evening Phone #: _____ ***Daytime Phone #:*** _____ ***E-mail:*** _____

Sex: ☐Failure to Report ☐Female ☐Male ☐Other ☐Transexual ☐Unknown

Race: ☐American Indian or Alaska Native ☐Asian ☐Black or African American ☐Native Hawaiian or Other Pacific Islander ☐White ☐Unknown

Hispanic / Latino Ethnicity: ☐Yes ☐No

Date of Birth: _____ ***Age:*** _____ ***Age Unit:*** ☐Days ☐Weeks ☐Months ☐Years

Worksites / School: _____

Occupations / Grade: _____

Exposure Information

Contact Type: ☐Household ☐Sexual ☐Other: _____ ***Partner / Cluster Code:*** _____

Date of First Exposure: _____ ***Date of Last Exposure:*** _____ ***Frequency:*** _____

Nature of Exposure: _____ ***Comments:*** _____

Testing and Treatment Information

Clinic Code: _____ ***Examination Date:*** _____

Examination Test: _____ ***Examination Result:*** _____

Prophylaxis/empiric treatment date: _____ ***Drug / Dosage:*** _____

Provider (Name / Facility): _____

Disposition and Diagnosis Information

Initiation Date: _____ ***Disposition Date:*** _____ ***Disposition:*** _____

Diagnosis: _____ ***Referral Type:*** ☐Patient ☐Provider ***Post-test Counseled :*** ☐Yes ☐No

Currently Assigned To: _____ ***Follow-up Date:*** _____

Risk Factors

Pregnant: ☐Yes ☐No ***If Yes, # of Weeks:*** _____

Risk factors for complications in contact: ☐None ☐Pregnant Woman ☐HIV Seropositive ☐Unimmunized ☐Index case is a super-spreader

☐Child younger than 5 ☐Age > 65 ☐Otherwise immunosuppressed (s/p transplant, high dose steroids, etc)

Enteric Disease Supplemental Form

Kansas Department of Health and Environment

Epidemiologic Case History

Condition

- ○ *Calicivirus/Norwalk-like virus (norovirus)*
- ○ *Campylobacter Infection (Campylobacter spp.)*
- ○ *Cryptosporidiosis (Cryptosporidium parvum)*
- ○ *Enterohemorrhagic Escherichia coli (EHEC)*
- ○ *Enterohemorrhagic Escherichia coli O157:H7*
- ○ *Enterohemorrhagic Escherichia coli shiga toxin positive (not serogrouped)*
- ○ *Enterohemorrhagic Escherichia coli shiga toxin positive (serogroup non-0157)*
- ○ *Giardiasis (Giardia lamblia)*
- ○ *Salmonellosis (Salmonella spp.)*
- ○ *Shigellosis (Shigella spp.)*
- ○ *Cyclosporiasis (Cyclospora cayetanensis)*
- ○ *Hepatitis A*
- ○ *Listeriosis (Listeria monocytogenes)*

* indicates required fields

Case Type*

○ *Human Case* ○ *Non Human Case*

Classification*

○ *Confirmed* ○ *Not a Case* ○ *Probable* ○ *Suspect* ○ *Deleted* ○ *Unknown*

Supplemental Form Status

○ *Not Done* ○ *Form Complete* ○ *Form in Progress* ○ *Form Approved* ○ *Form Sent to CDC*

Report Date*

mm/dd/yyyy

Date Investigation Started

mm/dd/yyyy

Patient Demographic Information

* indicates required fields

Last Name*	First Name*	Middle Name	Name Type*	Age

Age Unit

○ *Days* ○ *Weeks* ○ *Unknown* ○ *Months* ○ *Years*

Date of Birth
mm/dd/yyyy

Race*
(Check all that apply)

☐ *American Indian or Alaska Native* ☐ *Asian* ☐ *Black or African American*
☐ *Native Hawaiian or Other Pacific Islander* ☐ *White* ☐ *Unknown*

Ethnicity*

○ *Hispanic or Latino* ○ *Not Hispanic or Latino* ○ *Unknown*

Sex*

○ *Failure to Report* ○ *Female* ○ *Male* ○ *Other* ○ *Transexual* ○ *Unknown*

Street Address

City	County	State	Zip

Evening Phone
###-###-####

Daytime Phone
###-###-####

Occupation

High Risk Potential:
(Check all that apply)

☐ *Contact to a confirmed case*_____ ☐ *Contact to a suspected case*_____
☐ *Daycare attendee*_____ ☐ *Food handler*_____
☐ *Direct patient care worker*_____ ☐ *Institutional resident or staff*_____
☐ *Daycare worker*_____ ☐ *Animal handler*_____
☐ *Other*_____

If enrolled in day care, please complete the information below.

Name of Facility

Evening Phone
###-###-####

Street Address

City

County	State	Zip

Person Providing Report

Name of Reporting Facility*

Clinical and Laboratory Data

Individual diagnosed with

○ *Hemolytic Uremic Syndrome (HUS)* ○ *Thrombotic Thrombocytopenic Purpura (TTP)*

Was a stool specimen collected?

○ *Yes* ○ *No*

Diarrhea?	Number of Stools	Blood in Stool?	Vomiting?
○ *Yes* ○ *No* ○ *Unknown*	○ *0 - 2* ○ *3 - 10* ○ *11 and above*	○ *Yes* ○ *No* ○ *Unknown*	○ *Yes* ○ *No* ○ *Unknown*

Nausea?	Abdominal Cramps?	Muscle Ache?	Other Symptoms?
○ *Yes* ○ *No* ○ *Unknown*	○ *Yes* ○ *No* ○ *Unknown*	○ *Yes* ○ *No* ○ *Unknown*	○ *other*_____

What was the first Symptom	Date of Onset	Time of Onset
	mm/dd/yyyy	

Clinical and Laboratory Data cont.

Fever?
○ *Yes* ○ *No* ○ *Unknown*

If Yes, specify highest temperature:

Physician Information

Was a physician consulted for this illness?
○ *Yes (please complete the information below)* ○ *No*

Name of physician:

Evening Phone
###-###-####

Street Address

City

County

State

Zip

Antibiotic Information

Was case treated with antibiotics anytime in the 14 days prior to illness?
○ *Yes* ○ *No* ○ *Unknown*

Type of treatment/antibiotic

Reason for taking

Date started
mm/dd/yyyy

Date completed
mm/dd/yyyy

Was case treated with antibiotics for this illness?
○ *Yes* ○ *No* ○ *Unknown*

Type of treatment:

Date Started:
mm/dd/yyyy

Date completed:
mm/dd/yyyy

Was organism resistant to antibiotics?
○ *Yes* ○ *No* ○ *Unknown*

If yes, specify resistance pattern:

Is the patient on any medication or receiving any treatment which may suppress their immune system (i.e. Corticosteroids or Cancer Chemotherapy)?
○ *Yes* ○ *No* ○ *Unknown*

If yes please specify medication or treatment:

Did patient recover?
○ *Yes* ○ *No* ○ *Unknown*

Recover Date
mm/dd/yyyy

Recover Time

Exposure/Transmission

Did anyone else (in your family ..) recently have similar symptoms?
○ *Yes (please complete below)* ○ *No* ○ *Unknown*

Name	Age	Sex	Relationship to Case	Occupation	Symptoms	Date of Onset
						mm/dd/yyyy

Any restaurant, commercial food establishments, or group gatherings visited within the 7 days prior to onset of illness?
○ *Yes (please complete below)* ○ *No* ○ *Unknown*

Name of Establishment	City, County, State	Foods eaten	Date of Exposure
			mm/dd/yyyy

Travel History

Did the patient Travel prior to the onset of illness?

○ *Yes* ○ *No* ○ *Unknown*

If yes, please complete below:

Where:	**Departure Date:** mm/dd/yyyy	**Return Date:** mm/dd/yyyy
Where:	**Departure Date:** mm/dd/yyyy	**Return Date:** mm/dd/yyyy

Water Exposure

Possible water sources:

(Check all that apply)

☐ *Municipal Water System*_____ ☐ *Bottled Water*_____ ☐ *Private Well*_____

☐ *Rural Water System*_____ ☐ *Other (specify):*_____

Did patient drink water from other than a treated municipal system (i.e., stream, well)?

○ *Yes* ○ *No* ○ *Unknown*

Other Possible Exposure Information

Was there contact with pets or animals within 7 days prior to onset?

○ *Yes* ○ *No* ○ *Unknown*

If yes, please indicate below:

(Check all that apply)

☐ *Caged Birds* ☐ *Cats* ☐ *Cattle* ☐ *Chickens* ☐ *Dogs* ☐ *Ducks*
☐ *Frogs* ☐ *Goats* ☐ *Guinea Pigs* ☐ *Hamsters* ☐ *Horses* ☐ *Lizards*
☐ *Mice* ☐ *Parakeets* ☐ *Pigeons* ☐ *Pigs* ☐ *Poultry* ☐ *Rabbits*
☐ *Rats* ☐ *Sheep* ☐ *Snakes* ☐ *Turkeys* ☐ *Turtles* ☐ *Other*_____

Other Exposure Information

Other Birds? ○ *Yes* ○ *No* ○ *Unknown*	**If yes, please specify**	**Other Reptiles?** ○ *Yes* ○ *No* ○ *Unknown*	**If yes, please specify**
Other Animals? ○ *Yes* ○ *No* ○ *Unknown*		**If yes, please specify**	

Were any of these animals ill near the time of onset

○ *Yes* ○ *No* ○ *Unknown*

If yes, please describe:

Where were the animals located?

(Check all that apply)

☐ *Home* ☐ *Farm* ☐ *School* ☐ *Pet Store* ☐ *Zoo* ☐ *Petting Zoo* ☐ *Other*_____

Other Possible Exposure Information cont.

Within 7 days prior to onset of illness, did the patient participate in:

Activity	Participation	Date	Location
		mm/dd/yyyy	
Outdoor Activities			
Swimming			
Chlorinated Pool			
Wading Pool			
River/Lake/Pond			

Food History

Did case eat any of the following within 7 days prior to the onset of illness?

Food Product	Consumed	City, County, State	Variety or Brand(s)	Supplier	Supplier City
1. Chicken					
2. Hamburger					
3. Sausage					
4. Hot Dogs					
5. Lunch Meat					
6. Eggs					
7. Milk raw					
8. Milk past.					
8. Fresh juice					
10. Fresh berries					
11. Fresh melon					
12. Other fresh fruit					
13. Lettuce					
14. Alfalfa Sprouts					

Other fresh vegetables	Other Food Item 1	Other Food Item 2

At what store(s) do you regularly shop for groceries?

SEVEN-DAY ENTERIC QUESTIONNAIRE MODIFIED FOR CHILD CARE STAFF *(telephone interview)*

Hello, my name is _____. I am (*with/calling on behalf of)* the name *of health department* _____. We are currently investigating an outbreak of diarrhea and vomiting which has occurred at *name of child-care facility*. To assist us in our investigation, we are asking parents or guardians of **ALL** children enrolled at *name of child-care facility* to complete this questionnaire. Your participation is essential in this investigation. All information is confidential and will only be used for public health purposes. Do you have about 15 minutes to complete this questionnaire? (If they answer yes, continue. If they answer no, request a more convenient time to administer this questionnaire)

Diagnosis_____ Date: _____/_____/_____

Last Name: _____ First Name: _____

Date of Birth: _____/_____/_____ Sex: Male / Female

Street Address: _____

City: _____ State: ___ ZIP Code: _____

Home Phone: (_____)_____-_____

What is your job title? _____

If teacher:

What is the age group of your class? _____

Have you been working at this child-care facility since _____/_____/_____? **YES / NO**

Do you prepare meals (this includes mixing formula) for the children? **YES / NO**

Do you serve meals to the children? **YES / NO**

Did you have a child with diarrhea or vomiting in your class? **YES / NO / DON'T KNOWS**

If yes:

When did your first case occur? _____/_____/_____

Do you change diapers? **YES / NO**

Do you assist with toileting? **YES / NO**

Were there any activities in your class during the period of ____/____/____ to ____/____/____, which are not noted on your roster? **YES / NO**

If yes:

What	Where	When
_____	_____	_____/_____/____
_____	_____	_____/_____/____
_____	_____	_____/_____/____
_____	_____	_____/_____/____

Did the children in your class play with any animals during the period of ____/____/____ to ____/____/____? **YES / NO**

If yes:

What type?	Where?	When?
_____	_____	_____/_____/____
_____	_____	_____/_____/____
_____	_____	_____/_____/____
_____	_____	_____/_____/____

When did you start working at the child-care facility (hire on date)? _____/_____/_____ (mm/dd/yyyy)

Since _____/_____/_____ have you had diarrhea, vomiting or fever? **YES / NO**
If no, go to question 8.

Did you completely recover? **YES / NO**
If yes, Date of recovery _____/_____/_____ (mm/dd/yyyy)
Time: _____ am / pm

When did you first become ill? _____/_____/_____ (mm/dd/yyyy)

Indicate all symptoms:

Diarrhea (more than 3 loose stools in a 24 hour period) **YES / NO**

Bloody Diarrhea:	**YES / NO**	Number of stools/24 hours:	_____
Stomach ache:	**YES / NO**	Nausea:	**YES / NO**
Vomiting:	**YES / NO**	Muscle aches/pains:	**YES / NO**
Fever/Chills:	**YES / NO**	Highest temperature:	_____

Other symptoms? _____

Did you see a physician? **YES / NO**

If yes,

Name of physician: _____

Phone Number (_____)_____-_____

Were you hospitalized? **YES / NO**

If yes,

Hospital name: _____

Is or was any other family member or close personal contact experiencing any of the above-mentioned symptoms? **YES / NO**

If yes; list names:

Name	Relationship to child	Date of Birth	Onset Date
_____	_____	___/___/_____	___/___/____
_____	_____	___/___/_____	___/___/____
_____	_____	___/___/_____	___/___/____
_____	_____	___/___/_____	___/___/____
_____	_____	___/___/_____	___/___/____
_____	_____	___/___/_____	___/___/____
_____	_____	___/___/_____	___/___/____

In the 7 days prior to illness, did you have contact with any of the following animals?

Chicks? **YES / NO** Ducklings? **YES / NO**

Other Birds? **YES / NO** Specify_____

Reptiles (turtles, snakes, lizards, iguanas, etc.) **YES / NO**

Specify_____

Other pets or animals? **YES / NO**

Specify_____

Please indicate location and date of purchase of chicks, ducklings, other birds, or reptiles.

Store_____ City_____

Date: _____/_____/_____

Excluding activities at the child-care facility, did you visit a farm or petting zoo in the 7 days prior to illness? **YES / NO**

If yes:

Where_____ When ____/____/_____ (mm/dd/yyyy)

Where_____ _____ When ____/____/_____ (mm/dd/yyyy)

Excluding activities at the child-care facility, did you swim in a lake, river, or pool in the 7 days prior to illness? **YES / NO**

If yes:

Where_____ When ____/____/_____ (mm/dd/yyyy)

Where_____ When ____/____/_____ (mm/dd/yyyy)

Have you traveled outside the State of Kansas in the 7 days prior to illness?

YES / NO

If yes:

City_____ State____Dates: ____/____/____ to ____/____/____

City_____ State____Dates: ____/____/____ to ____/____/____

Have you traveled outside the United States of America in the 7 days prior to illness?

YES / NO

If yes:

Country_____ Dates: ____/____/____ to ____/____/____

Country_____ Dates: ____/____/____ to ____/____/____

What is the source of your drinking water (indicate all that apply)?

Public water system? **YES / NO** Name_____

Private well? **YES / NO**

Bottled water? **YES / NO** Name_____

Did you eat in any restaurants in the 7 days prior to illness? **YES / NO**

Please list the restaurants to the best of your recollection:

A) Name_____ City_____ Date ____/____/____

Foods eaten: _____

B) Name_____ City_____ Date ____/____/____

Foods eaten: _____

C) Name_____ City_____ Date ____/____/____

Foods eaten: _____

D) Name_____ City_____ Date ____/____/____

Foods eaten: _____

Did you attend any parties, fairs, carnivals, family/social gatherings, or other events at which food was provided, in the 7 days prior to illness? **YES / NO**

Name/description of event_____ City_____
Date ____/____/____
Foods eaten_____

Indicate which of the following foods that you ate in the 7 days prior to illness. If unsure, answer yes to any foods that you eat routinely. To the best of your recollection, also provide the brand names and the store names and locations where you purchased them.

Raw unpasteurized milk? **YES / NO** Brand_____
Store name_____ City_____

Pasteurized milk? **YES / NO** Brand_____
Store name_____ City_____

Unpasteurized apple cider? **YES / NO** Brand_____
Store name_____ City_____

Ground beef or hamburgers? **YES / NO** Brand_____
Store name_____ City_____

Steaks? **YES / NO** Brand_____
Store name_____ City_____

Chicken? **YES / NO** Brand_____
Store name_____ City_____

Sausage? **YES / NO** Brand_____
Store name_____ City_____

Hot Dogs? **YES / NO** Brand_____
Store name_____ City_____

Lunch Meat? **YES / NO** Brand_____
Store name_____ City_____

Eggs? **YES / NO** Brand_____
Store name_____ City_____

Fresh Juice? **YES / NO** Brand_____
Store name_____ City_____

Fresh Berries? **YES / NO** Brand_____

Store name_____ City_____

Fresh Melon? **YES / NO** Brand_____

Store name_____ City_____

Other Fresh Fruits? **YES / NO** Brand_____
Store name_____ City_____

Lettuce? **YES / NO** Brand_____
Store name_____ City_____

Alfalfa Sprouts? **YES / NO** Brand_____
Store name_____ City_____

Other Fresh Vegetables? **YES / NO** Brand_____
Store name_____ City_____

Other foods, which may have caused your illness? _____
Brand_____ Store name_____
City_____

Comments: _____

_____

_____

_____

Date: _____

Dear _____,

The stool sample for _____, collected on _____ has tested positive for the bacterial pathogen(s):

☐ E. Coli: O157:H7 ☐ Campylobacter ☐ Other _____

☐ Salmonella ☐ Shigella

The Following action(s) is necessary:

☐ None.

☐ Contact your Local Health Department at _____ for an additional interview.

☐ Inform your physician that your laboratory tests are positive if he/she is not aware of these results. He/she will decide if antibiotics need to be prescribed. If your physician decides not to treat you with antibiotics please remember that the bacteria may be transmitted to others as long it is present in your stool. This may persist for several weeks even though you may no longer have symptoms. It is important to note that frequent and thorough hand washing will minimize risk of transmission to others.

☐ You may not work in food handling, direct patient care or occupations involving the care of young children or the elderly until:

- ☐ You experience no diarrhea for 24 hours.
- ☐ Your stool specimens test negative 2 consecutive times. (Stool samples should be collected 24 hours apart and no sooner than 48 hours after you last dose of antibiotics.)
- ☐ The local health officer or the Secretary of Health and Environment issues an order allowing you to return to work.

☐ Your child may not attend school or daycare until:

- ☐ He/she experiences no diarrhea for 24 hours.
- ☐ His/her stool specimens test negative 2 consecutive times. (Stool samples should be collected 24 hours apart and no sooner than 48 hours after your last dose of antibiotics.)

Sincerely,

Investigator Name, Title
Phone #
Address Line 1
Address Line 2
City, State Zip Code

Public Health Fact Sheet
E. coli

What is *E. coli*?

Escherichia coli (abbreviated as *E. coli*) are a large, diverse group of bacteria. Although most strains are harmless, others can make you sick. Some kinds of E. coli can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses. When *E. coli* is detected in drinking water, it is evidence that the water is contaminated but the *E. coli* themselves may not be a type that can cause disease.

What are Shiga toxin-producing *E. coli*?

Some kinds of *E. coli* cause illness by making a toxin called Shiga toxin. The bacteria that make these toxins are called "Shiga toxin-producing E. coli" or STEC. The most commonly identified STEC in North America is *E. coli* O157:H7 (often called *E. coli* O157 or even just "O157"). When you hear news reports about outbreaks of "E. coli" infections, they are usually talking about *E. coli* O157.

What are the symptoms of STEC or *E. coli* 0157 infection?

The most common symptoms are severe stomach cramps and diarrhea which usually develops 4 days after exposure but may be delayed until 10 days after exposure. Some people vomit and may have a fever. Sometimes the diarrhea turns bloody after 2-3 days. Most people get better in 5-7 days, but a small number of people, may develop a rare but serious problem called hemolytic uremic syndrome (HUS). A person developing HUS has decreased frequency of urination, feels very tired, and loses the pink color in cheeks and inside the lower eyelids. Persons with HUS should be hospitalized.

Where is STEC or *E. coli* 0157 found?

STEC or *E. coli* 0157 live in the guts of ruminant animals, including cattle, goats, sheep, deer, and elk. The major source for human illnesses is cattle, but STEC generally do not make animals sick. Other kinds of animals, including pigs and birds, can pick up STEC or *E. coli* 0157 from the environment and spread it.

How is STEC or *E. coli* 0157 spread?

The germs must be swallowed to cause infection. This can happen if you eat or drink something that contains these germs and is not properly cooked or treated. It can spread by not thoroughly washing hands with soap or water after touching animals or their surroundings and before preparing or eating food. Anyone who swallows contaminated water while swimming can also be infected.

How is STEC or *E. coli* 0157 diagnosed?

It can only be diagnosed by testing a stool sample. It is not a routine test, so your doctor or nurse must ask the laboratory to test for it.

This fact sheet is for information only and is not intended for self-diagnosis or as a substitute for consultation. If you have any questions about the disease described above or think that you may have an infection, consult with your healthcare provider. This fact sheet is based on the Centers for Disease Control and Prevention's Health and Safety topic fact sheets.

Version 03/2009

How is the disease treated?
Your doctor will tell you what is best. Taking medicine on your own may not help you get better, and it could make things worse. Do not take antibiotics or diarrhea medicine like Imodium® unless your doctor tells you to. It may make things worse.

How can you prevent it?
Remember that *E. coli* can only make you sick if you ingest them, and that it can be killed thorough cooking. Some general guidelines include:

- WASH YOUR HANDS thoroughly after using the bathroom or changing diapers and before preparing or eating food.
- WASH YOUR HANDS after contact with animals or their environments (at farms, petting zoos, fairs, even your own backyard).
- COOK meats thoroughly. Ground beef and meat that has been needle-tenderized should be cooked to a temperature of at least 160°F (70˚C). It's best to use a thermometer, as color is not a reliable indicator.
- AVOID raw milk, unpasteurized dairy products, and unpasteurized juices (like fresh apple cider).
- AVOID swallowing water when swimming or playing in lakes, ponds, streams, swimming pools, and backyard "kiddie" pools. Those who have been ill can spread illness to others if they do not wait until 2 weeks after their diarrhea has stopped before swimming or playing in these places.
- PREVENT cross contamination in food preparation areas by washing hands, counters, cutting boards, and utensils after they touch raw meat.

Are there any restrictions for people with STEC or *E. coli* 0157?
Yes. People with diarrhea should not go to school or work. People may return to school or work when they no longer have diarrhea. Children diagnosed with STEC or *E. coli* 0157 must also be excluded from daycare until diarrhea has ceased and they no longer have STEC or *E. coli* 0157 in their stools (two negative stool cultures). Workers involved in food handling, patient care, and any occupation involving the care of young children and the elderly, are also not allowed to work until they no longer have STEC or *E. coli* 0157 in their stools (two negative stool cultures). Workers in food-related businesses who have diarrhea and live with someone who has STEC or *E. coli* 0157 should also be restricted from handling food.

Where can I get more information?

- Your Local Health Department
- Kansas Department of Health and Environment, Epidemiologic Services
- Section (877) 427-7317
- http://www.cdc.gov/health/default.htm
- Your doctor, nurse, or local health center

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